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1 Facial animation framework for the web and mobile platforms   ■
Igor S. Pandzic
February 2002 **Proceeding of the seventh international conference on 3D Web
technology**

Full text available: 🗎 pdf(906.61 KB)   Additional Information: full citation, abstract, references, citings, index terms

Talking virtual characters are graphical simulations of real or imaginary persons capable of
human-like behavior, most importantly talking and gesturing. They may find applications on
the Internet and mobile platforms as newscasters, customer service representatives, sales
representatives, guides etc. After briefly discussing the possible applications and the
technical requirements for bringing such applications to life, we describe our approach to
enable these applications: the Facial Animation ...

Keywords: FBA, MPEG-4, VRML, facial animation, facial motion cloning, talking head,
virtual characters, virtual humans, visual text-to-speech

2 A morphable model for the synthesis of 3D faces   ■
Volker Blanz, Thomas Vetter
July 1999 **Proceedings of the 26th annual conference on Computer graphics and
interactive techniques**
Full text available: 🗎 pdf(2.76 MB)   Additional Information: full citation, references, citings, index terms

Keywords: computer vision, facial animation, facial modeling, morphing, photogrammetry,
registration

3 Synthesizing realistic facial expressions from photographs   ■
Frédéric Pighin, Jamie Hecker, Dani Lischinski, Richard Szeliski, David H. Salesin
July 1998 **Proceedings of the 25th annual conference on Computer graphics and
interactive techniques**
Full text available: 🗎 pdf(276.04 KB)   Additional Information: full citation, references, citings, index terms

Keywords: facial animation, facial expression generation, facial modeling, morphing,

photogrammetry, view-dependent texture-mapping

4 Facial animation & hair: An example-based approach for facial expression cloning
Hyewon Pyun, Yejin Kim, Wonseok Chae, Hyung Woo Kang, Sung Yong Shin
July 2003   **Proceedings of the 2003 ACM SIGGRAPH/Eurographics Symposium on
Computer animation**

Full text available: pdf(9.61 MB)   Additional Information: full citation, abstract, references, citings, index terms

In this paper, we present a novel example-based approach for cloning facial expressions of a source model to a target model while reflecting the characteristic features of the target model in the resulting animation. Our approach comprises three major parts: key-model construction, parameterization, and expression blending. We first present an effective scheme for constructing key-models. Given a set of source example key-models and their corresponding target key-models created by animators, we ...

Keywords: example-based synthesis, facial animation, facial expression cloning, motion retargetting, scattered data interpolation

5 Trainable videorealistic speech animation
Tony Ezzat, Gadi Geiger, Tomaso Poggio
July 2002   **ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual
conference on Computer graphics and interactive techniques**, Volume 21 Issue 3

Full text available: pdf(524.89 KB)   Additional Information: full citation, abstract, references, citings, index terms

We describe how to create with machine learning techniques a generative, speech animation module. A human subject is first recorded using a videocamera as he/she utters a predetermined speech corpus. After processing the corpus automatically, a visual speech module is learned from the data that is capable of synthesizing the human subject's mouth uttering entirely novel utterances that were not recorded in the original video. The synthesized utterance is re-composited onto a background sequence ...

Keywords: facial animation, facial modeling, lip synchronization, morphing, optical flow, speech synthesis

6 FaceEngine a 3D facial animation engine for real time applications
Gaspard Breton, Christian Bouville, Danielle Pelé
February 2001 **Proceedings of the sixth international conference on 3D Web technology**

Full text available: pdf(914.00 KB)   Additional Information: full citation, references, index terms

Keywords: avatars, facial animation, muscles based system, talking-head, virtual humans

7 Facial animation and vision realistic rendering: Towards perceptually realistic talking
heads: models, methods and McGurk
Darren Cosker, Susan Paddock, David Marshall, Paul. L. Rosin, Simon Rushton
August 2004 **Proceedings of the 1st Symposium on Applied perception in graphics and
visualization APGV '04**

Full text available: pdf(438.40 KB)   Additional Information: full citation, abstract, references, index terms

Motivated by the need for an informative, unbiased and quantitative perceptual method for

the development and evaluation of a talking head we are developing, we propose a new test based on the "McGurk Effect". Our approach helps to identify strengths and weaknesses in underlying talking head algorithms, and uses this insight to guide further development. The test also evaluates the realism of talking head *behavior* in comparison to real speaker footage, painting an overall picture of a tal ...

Keywords: McGurk effect, audio analysis, facial animation, learning, lip-syncing, perceptual analysis, psychological analysis, video analysis, video synthesis

8 Skinning: Model-based reconstruction for creature animation

Maryann Simmons, Jane Wilhelms, Allen Van Gelder

July 2002 **Proceedings of the 2002 ACM SIGGRAPH/Eurographics symposium on Computer animation**

Full text available: pdf(2.12 MB)   Additional Information: full citation, abstract, references, citings

An semi-automatic technique for creating 3D models of creatures suitable for animation is presented. An anatomically based canonical model is deformed, given a sparse set of feature points derived from measurements describing the target animal. The layered canonical model is built on top of an articulated structure hierarchy and contains a representation of the animal's skeleton, muscles, and skin. The joint hierarchy and associated body components are transformed based on the input data. A dens ...

Keywords: 3D morphing, animation, model reconstruction, shape interpolation

9 Expression cloning

Jun-yong Noh, Ulrich Neumann

August 2001 **Proceedings of the 28th annual conference on Computer graphics and interactive techniques**

Full text available: pdf(941.00 KB)   Additional Information: full citation, abstract, references, citings, index terms

We present a novel approach to producing facial expression animations for new models. Instead of creating new facial animations from scratch for each new model created, we take advantage of existing animation data in the form of vertex motion vectors. Our method allows animations created by any tools or methods to be easily retargeted to new models. We call this process *expression cloning* and it provides a new alternative for creating facial animations for character models. Expression ...

Keywords: deformations, facial animation, morphing, neural nets

10 Performance-driven hand-drawn animation

Ian Buck, Adam Finkelstein, Charles Jacobs, Allison Klein, David H. Salesin, Joshua Seims, Richard Szeliski, Kentaro Toyama

June 2000 **Proceedings of the 1st international symposium on Non-photorealistic animation and rendering**

Full text available: pdf(1.82 MB)   Additional Information: full citation, references, citings, index terms

Keywords: animation, face tracking, image morphing, non-photorealistic rendering

11 Character/web: Animated deformations with radial basis functions

Jun-yong Noh, Douglas Fidaleo, Ulrich Neumann

October 2000 **Proceedings of the ACM symposium on Virtual reality software and technology**

Full text available: ⬚ pdf(2.26 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>index terms</u>

We present a novel approach to creating deformations of polygonal models using Radial Basis Functions (RBFs) to produce localized real-time deformations. Radial Basis Functions assume surface smoothness as a minimal constraint and animations produce smooth displacements of affected vertices in a model. Animations are produced by controlling an arbitrary sparse set of control points defined on or near the surface of the model. The ability to directly manipulate a facial surface with a small numbe ...

Keywords: Facial Animation, Geometry Deformation, MPEG-4, Radial Basis Functions

12 <u>Mood swings: expressive speech animation</u>   ■

Erika Chuang, Christoph Bregler

April 2005 **ACM Transactions on Graphics (TOG)**, Volume 24 Issue 2

Full text available: ⬚ pdf(8.58 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>index terms</u>

Motion capture-based facial animation has recently gained popularity in many applications, such as movies, video games, and human-computer interface designs. With the use of sophisticated facial motions from a human performer, animated characters are far more lively and convincing. However, editing motion data is difficult, limiting the potential of reusing the motion data for different tasks. To address this problem, statistical techniques have been applied to learn models of the facial motion ...

Keywords: Facial animation, expression, motion, retargeting

13 <u>Facial animation & hair: Learning controls for blend shape based realistic facial</u>   ■
<u>animation</u>

Pushkar Joshi, Wen C. Tien, Mathieu Desbrun, Frédéric Pighin

July 2003 **Proceedings of the 2003 ACM SIGGRAPH/Eurographics Symposium on Computer animation**

Full text available: ⬚ pdf(4.11 MB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

Blend shape animation is the method of choice for keyframe facial animation: a set of blend shapes (key facial expressions) are used to define a linear space of facial expressions. However, in order to capture a significant range of complexity of human expressions, blend shapes need to be segmented into smaller regions where key idiosyncracies of the face being animated are present. Performing this segmentation by hand requires skill and a lot of time. In this paper, we propose an automatic, phy ...

14 <u>Facial animation (panel): past, present and future</u>   ■

Demetri Terzopoulos, Barbara Mones-Hattal, Beth Hofer, Frederic Parke, Doug Sweetland, Keith Waters

August 1997 **Proceedings of the 24th annual conference on Computer graphics and interactive techniques**

Full text available: ⬚ pdf(1.22 MB)   Additional Information: <u>full citation</u>, <u>references</u>, <u>citings</u>

15 <u>Animation: Rapid modeling of 3D faces for animation using an efficient adaptation</u>   ■
<u>algorithm</u>

Yu Zhang, Terence Sim, Chew Lim Tan

June 2004 **Proceedings of the 2nd international conference on Computer graphics and**

interactive techniques in Australasia and Southe East Asia

Full text available: 🔴 pdf(563.30 KB)   Additional Information: full citation, abstract, references, index terms

This paper presents a new efficient method for the reconstruction of a personalized 3D facial model for animation from range data. Our method adapts a generic control model with anatomical structure to the geometry of a specific person's face with minimum manual intervention. The face adaptation algorithm starts with the specification of a small set of anthropometric landmarks on the 2D images of both the generic control model and individual face. 3D positions of landmarks are recovered automati ...

Keywords: adaptation algorithm, facial animation, generic control model, personalized face modeling, range scans

16 Industrial Session: Speech-driven cartoon animation with emotions   ⬛
Yan Li, Feng Yu, Ying-Qing Xu, Eric Chang, Heung-Yeung Shum
October 2001 **Proceedings of the ninth ACM international conference on Multimedia**

Full text available: 🔴 pdf(3.03 MB)   Additional Information: full citation, abstract, references, index terms

In this paper, we present a cartoon face animation system for multimedia HCI applications. We animate face cartoons not only from input speech, but also based on emotions derived from speech signal. Using a corpus of over 700 utterances from different speakers, we have trained SVMs (support vector machines) to recognize four categories of emotions: neutral, happiness, anger and sadness. Given each input speech phrase, we identify its emotion content as a mixture of all four emotions, rather than ...

Keywords: cartoon animation, lip-syncing, multimedia HCI, recognition, speech emotion

17 Heads, faces, hair: Head shop: generating animated head models with anatomical   ⬛
structure
Kolja Kähler, Jörg Haber, Hitoshi Yamauchi, Hans-Peter Seidel
July 2002 **Proceedings of the 2002 ACM SIGGRAPH/Eurographics symposium on Computer animation**

Full text available: 🔴 pdf(9.67 MB)   Additional Information: full citation, abstract, references, citings, index terms

We present a versatile construction and deformation method for head models with anatomical structure, suitable for real-time physics-based facial animation. The model is equipped with landmark data on skin and skull, which allows us to deform the head in anthropometrically meaningful ways. On any deformed model, the underlying muscle and bone structure is adapted as well, such that the model remains completely animatable using the same muscle contraction parameters. We employ this general techni ...

Keywords: biological modeling, deformations, facial animation, geometric modeling, morphing, physically based animation

18 Facial animation & hair: Vision-based control of 3D facial animation   ⬛
Jin-xiang Chai, Jing Xiao, Jessica Hodgins
July 2003 **Proceedings of the 2003 ACM SIGGRAPH/Eurographics Symposium on Computer animation**

Full text available: 🔴 pdf(12.59 MB)   Additional Information: full citation, abstract, references, citings, index terms

Controlling and animating the facial expression of a computer-generated 3D character is a difficult problem because the face has many degrees of freedom while most available input

devices have few. In this paper, we show that a rich set of lifelike facial actions can be created from a preprocessed motion capture database and that a user can control these actions by acting out the desired motions in front of a video camera. We develop a real-time facial tracking system to extract a small set of a ...

19 Facial animation & hair: Geometry-driven photorealistic facial expression synthesis

Qingshan Zhang, Zicheng Liu, Baining Guo, Harry Shum

July 2003   **Proceedings of the 2003 ACM SIGGRAPH/Eurographics Symposium on Computer animation**

Full text available: pdf(62.32 MB)   Additional Information: full citation, abstract, references, citings, index terms

Expression mapping (also called performance driven animation) has been a popular method to generate facial animations. One shortcoming of this method is that it does not generate expression details such as the wrinkles due to the skin deformation. In this paper, we provide a solution to this problem. We have developed a geometry-driven facial expression synthesis system. Given the feature point positions (geometry) of a facial expression, our system automatically synthesizes the corresponding ex ...

20 The morph node

Marc Alexa, Johannes Behr, Wolfgang Müller

February 2000   **Proceedings of the fifth symposium on Virtual reality modeling language (Web3D-VRML)**

Full text available: pdf(159.90 KB)   Additional Information: full citation, abstract, references, citings, index terms

We discuss potential and limitations of a Morph Node, inspired by the corresponding construct in Java3D. A Morph Node in Java3D interpolates vertex attributes among several homeomorphic geometries. This node is a promising candidate for the delivery of 3D animation in a very compact form. We review the state-of-the-art in Web 3D techniques with respect to the possibility of interpolating among several geometries. This review leads to a simple extension for VRML-97 as well as a recommendatio ...

Keywords: VRML, animation, avatars, morphing, virtual humans

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Verma, A.; Subramaniam, L.V.; Rajput, N.; Neti, C.; Faruquie, T.A.;
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Volume 6, Issue 6, Dec. 2004 Page(s):791 - 800
Digital Object Identifier 10.1109/TMM.2004.837256

AbstractPlus | References | Full Text: PDF(1528 KB)   IEEE JNL

☐   2. **Advanced framework for an error-resilient parameter analysis-synthesis ¦ animation**
Fu Yun; Zheng NanNing;
Systems, Man and Cybernetics, 2003. IEEE International Conference on
Volume 5, 5-8 Oct. 2003 Page(s):4528 - 4534 vol.5

AbstractPlus | Full Text: PDF(666 KB)   IEEE CNF

☐   3. **Flexible face animation using MPEG-4/SNHC parameter streams**
Jialin Zhong;
Image Processing, 1998. ICIP 98. Proceedings. 1998 International Conference
Volume 2, 4-7 Oct. 1998 Page(s):924 - 928 vol.2
Digital Object Identifier 10.1109/ICIP.1998.723706

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Ulgen, F.;
Robot and Human Communication, 1997. RO-MAN '97. Proceedings., 6th IEEl
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29 Sept.-1 Oct. 1997 Page(s):358 - 363
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Computer Graphics and Applications, 2001. Proceedings. Ninth Pacific Confer¦
16-18 Oct. 2001 Page(s):314 - 321
Digital Object Identifier 10.1109/PCCGA.2001.962887

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☐   6.
Image morphing of facial images transformation based on Navier elastic ¦

Hassanien, A.; Nakajima, M.;
Computer Animation 98. Proceedings
8-10 June 1998 Page(s):119 - 125
Digital Object Identifier 10.1109/CA.1998.681916

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7. **Cloning and aging in a VR family**
Won-Sook Lee; Yin Wu; Magnenat-Thalmann, N.;
Virtual Reality, 1999. Proceedings., IEEE
13-17 March 1999 Page(s):61 - 68
Digital Object Identifier 10.1109/VR.1999.756924

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8. **FaceSpace: a facial spatial-domain toolkit**
DiPaola, S.;
Information Visualisation, 2002. Proceedings. Sixth International Conference o
10-12 July 2002 Page(s):105 - 109
Digital Object Identifier 10.1109/IV.2002.1028763

AbstractPlus | Full Text: PDF(427 KB)   IEEE CNF

9. **Proceedings Computer Animation '98 (Cat. No.98EX169)**
Computer Animation 98. Proceedings
8-10 June 1998
Digital Object Identifier 10.1109/CA.1998.681898

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animations**
Aboul-Ella, H.; Nakajima, M.;
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27-29 Aug. 1997 Page(s):106 - 110
Digital Object Identifier 10.1109/IV.1997.626496

AbstractPlus | Full Text: PDF(648 KB)   IEEE CNF

11. **Resynthesizing facial animation through 3D model-based tracking**
Pighin, F.; Szeliski, R.; Salesin, D.H.;
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Volume 1, 20-27 Sept. 1999 Page(s):143 - 150 vol.1
Digital Object Identifier 10.1109/ICCV.1999.791210

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Tiddeman, B.; Perrett, D.;
Computer Animation, 2002. Proceedings of
19-21 June 2002 Page(s):248 - 251
Digital Object Identifier 10.1109/CA.2002.1017545

AbstractPlus | Full Text: PDF(643 KB)   IEEE CNF

13. **Towards realistic facial modeling and re-rendering of human skin aging a
**Hussein, H.K.;
Shape Modeling International, 2002. Proceedings
17-22 May 2002 Page(s):205 - 212
Digital Object Identifier 10.1109/SMI.2002.1003547

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